



Equal Value

Can a major Severn Tidal Power scheme be compatible with enhancing the Natura 2000 Biodiversity Network?

Recommendations to the Severn Tidal Power Project Board
as part of the Severn Tidal Power Feasibility Study

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With special thanks to the workshop participants from Phase One and Jo Treweek and Bill Butcher for the Phase Two technical report.

Executive Summary

1. The Equal Value Investigation has been led by the Sustainable Development Commission (SDC) on behalf of the Department for Energy and Climate Change (DECC) and forms part of the wider Severn Tidal Power (STP) Feasibility Study. Our work is just one element within the wider STP Feasibility Study, and as such must be considered within the context of emerging findings from the full study.
2. A decision to go ahead with one of the larger of the proposed STP schemes, such as the Cardiff Weston barrage or the Fleming lagoon, would represent a step change in renewable infrastructure in the UK. It is highly likely that the impacts on the Severn Estuary caused by such a scheme could not be wholly compensated for within the current, non-statutory European Commission guidance on the Habitats and Birds Directives ("the Directives"). This study therefore attempts to answer whether, in principle, additional and novel compensation measures could be put in place which are outside current guidance but would comply with the Directives: by enhancing the overall coherence of the Natura 2000 network and / or the conservation status of species and habitats within it. In other words, a step change in delivering on climate change reduction / increasing energy diversity / supply / climate change adaptation merits a step change in ambition when thinking about ecological networks.
3. There have been two phases to this work. Phase one involved two deliberative workshops involving a range of experts, phase two a technical study based on the concepts and ideas generated in phase one. Both reports are available and underpin this non-technical summary.
4. This issue has potential relevance well beyond the specific test case of the Severn. On the one hand, it is acknowledged by many ecologists that the predicted impacts of climate change on our EU-designated protected areas mean it may become increasingly difficult to maintain the integrity of individual sites and a broader systems approach to conservation may in future be required. On the other, the EU Habitats and Birds Directives represent best practice in biodiversity conservation on a global scale, so any change in their implementation must be guaranteed to enhance rather than to undermine the outcomes the Directives are intended to secure. It is therefore essential that if the UK Government decides to investigate the approach further it must do so with the utmost rigour and transparency and with the full engagement of stakeholders. Failure to do this would risk undermining the Directives.
5. **With these strong caveats, our conclusion at this stage is that such an approach might be feasible, albeit involving an unprecedented level of challenge. We have proposed a set of principles and tests which could begin to form the basis of a new methodology for compensation outside current EU guidance but compliant with the Directives themselves. Crucially, the sorts of measures discussed should only be considered once all other existing approaches to mitigation and compensation have been fully explored.** For illustrative purposes only, we have investigated how these principles might be applied to the case of a species of freshwater fish (the Allis Shad) and a type of habitat (mudflat).

6. There is a tension between what might succeed in ecological terms and what might be deliverable in practice or acceptable from a political and legal perspective. From an ecological systems perspective, ability to compensate is constrained by the availability of suitable sites and there are some cases where this could potentially be addressed by widening the geographic area within which compensation could be delivered. This might mean delivering compensation in other Member States in order to maintain or enhance the conservation status of a habitat or species within the Biogeographic Region or the Natura 2000 network as a whole. The Severn Estuary forms part of the Atlantic Biogeographic Region – which also includes France, Spain and Portugal – so taking a biogeographic approach gives the most options for ecological enhancement. We recognise that there is no current precedent for such an approach to habitat compensation. However, restricting any measures to within the UK, whilst reducing the political complexity, would

Context for the SDC investigation

The SDC Position on Tidal Power

8. The SDC's position on a Severn barrage remains as set out in our *'Turning the Tide: Tidal Power in the UK'* report¹, published in 2007, broadly supportive, but subject to several conditions which we believe must be met for any such scheme to be considered consistent with the principles of sustainable development. We recommended that any consideration of a barrage must be taken within a framework that places a

inevitably also reduce the likelihood of success given the more limited options for enhancing habitats or species populations within this country.

7. The public debate about Severn Tidal Power is very robust, with strongly held views on both sides, and any decision will be of huge interest and has the potential to set precedents both in the UK and across Europe. Since the handling of biodiversity impacts is one of the areas that will rightly be subject to intense scrutiny, **the SDC recommends that far more thorough research, coupled with open and transparent public and stakeholder engagement is necessary before these new approaches could be adopted with confidence.** We are confident, however, that our investigation has started an important and timely debate, and represents a real opportunity for the broadening of thinking about biodiversity conservation in the face of the twin challenges of climate change and the scale of energy infrastructure development that will be need to be put in place across the EU. high value on the long-term public interest and on maintaining the overall integrity of internationally recognised habitats and species.

¹ SDC 'Turning the Tide: Tidal Power in the UK', 2007. <http://www.sd-commission.org.uk/publications.php?id=607>

9. The report's conclusions are summarised below:

The maintenance of habitats and species designated under the Habitats Directive is a statutory obligation that should be vigorously upheld. Any proposal for a Severn barrage must fully comply with the Directives and adhere rigorously to the process they set out. The SDC would be firmly against any moves to revise or derogate from the Directives to facilitate proposals for a Severn Barrage.

The Government would need to ensure that a decision in favour of a Severn barrage was only part of a major effort to deliver at least a 60% cut in greenhouse gases by 2050. (*Target now increased to 80%*).

A public sector-led approach would be the best way to reconcile the need for low carbon electricity generation with the protection of internationally important habitats and species.

Impact on Natura 2000 Network

10. The Severn Estuary is a unique and dynamic environment and is protected under a range of national and international legislation. Designation under the Birds and Habitats Directives is for sites to contribute to the maintenance and recovery of species and habitats to favourable conservation status, thereby protecting against loss of biodiversity at a European level. The significant impacts of harnessing its tidal power, on local, national and internationally important habitats and species, is covered in the

Phase One report and within the wider STP Feasibility Study.

11. The Severn Estuary is also designated as a Ramsar site which, as a matter of policy, the UK Government treats as if they were designated under the Directives. However it would be outside the scope of the European Commission to consider compensatory measures for Ramsar features. Consideration will therefore need to be given about the extent to which the findings of this investigation might be applied to compensation for impacts on Ramsar features.

Phase One

Background to the Equal Value Investigation

12. The governance structure for the Investigation consisted of a Core Group, consisting of representatives from DECC, Defra, Natural England, the Environment Agency and Countryside Council for Wales, to provide oversight and advice on the project. Additional expertise and supervision has been provided by a sub group of Commissioners from the SDC and findings have been discussed by the full group of SDC Commissioners in plenary. The investigation itself was divided into two phases.

13. Two deliberative stakeholder workshops were held to provide a space for discussion, recognising both the sensitivity of the subject matter and the organisational positions of participants. Stakeholders were invited on the basis of their individual profiles, not for the views of any associated organisations, and were drawn from policy making, academia and civil society. The workshops were designed and run in partnership with Dr. Catrin Ellis Jones, an independent facilitator.
14. Generally, participants acknowledged both the need for fresh thinking around biodiversity and conservation in the light

of climate change, as well as the radical, unprecedented scale of compensation that would be required to address the loss of the Severn's unique character. A range of potential compensation options emerged from the two workshop, varying in type and scale, which were grouped under four categories:

- Habitat Creation / Enhancement - large-scale creation of new habitat, as well as the enhancement of existing habitat
 - Ecological Networks - improving functional connectivity between sites, thereby encouraging movement of migratory species between them
 - Further Designations - identification of sites that could improve coherence of the network if designated
 - Accounting Mechanisms / Funding / Governance
17. Probably the most important issue to arise from the workshops, and the only point of consensus, was the lack of clarity around central concepts such as definitions of network coherence and conservation status. The impacts and levels of climate change and subsequent compensation requirements are also difficult to estimate with any precision. Finally, considerable concern was expressed as to the precedence that developing and applying Equal Value would set and the subsequent risk of weakening of the Directives. This concern around precedent was a continuous theme throughout the Equal Value Investigation.
18. Despite the lack of clarity around key concepts identified by workshop participants, it was concluded that there might be scope to explore alternative approaches to compensation based on the concept of "equal value" in terms of the coherence of the Natura 2000

Further details of these options are contained within the Phase One report.

15. It is important to note that the identification process was carried out without two critical components:
- knowledge of the precise ecological impacts that could be expected after construction of an STP scheme
 - information on the likely extent for provision of 'like for like' compensation.
16. If these options are to be effectively assessed, and they are only a snapshot generated by a limited group of workshop participants, they will need to be considered in light of the findings of other components of the STP feasibility study on 'like for like' compensation.
- network as a whole or the conservation status of European habitats and species.
19. These critical issues remain unresolved and will need to be addressed in a sensitive and inclusive manner if the concept of Equal Value is to be understood, agreed and delivered in practice.

Phase Two

20. A technical study was commissioned from Treweek Environmental Consultants to develop possible approaches to the delivery of Equal Value ecological compensation in the event that it might prove impossible to identify compensation for residual impacts (those remaining after all appropriate steps had been taken to mitigate for adverse effects) in accordance with the Directives' current guidance. The study is based on the premise that all compensation should be designed with the fundamental goal of achieving "ecological equivalence" and identifies

possible principles and criteria which could be used to help determine whether this has been achieved.

21. Commentary and analysis to determine the acceptability or otherwise of proposed mitigation or compensation, from a legal, administrative or practical perspective, was outside the scope of this study. Any proposals will therefore require rigorous testing with relevant stakeholders.
22. The Phase Two report covers four areas:
 - An explanation of the background and need for consideration of Equal Value or ecological equivalence in the context of the STP options
 - A review of the requirements of the Habitats Directive with respect to compensation and the relationship between coherence and Favourable Conservation Status
 - A review of key issues that need to be addressed to demonstrate equivalence of compensation options
 - A possible framework for validating compensation options based on principles and tests of equivalence.
23. Analysis of compensation requirements under the Directives confirmed the findings of Phase One, that a lack of proper definition of key concepts such as coherence makes it difficult to determine how compensation may maintain or increase that coherence. The concept of Favourable Conservation Status (FCS) is another key issue where there is a lack of clarity and consistency in interpretation. Member States report against certain parameters agreed at European level, but monitoring against these parameters has proved to be complex and difficult in practice. Defining favourable conservation status for individual habitats and species is in practice a complex and very difficult judgement to make with a

measure of certainty. Reporting on conservation status is undertaken at biogeographical level. This is relatively straightforward for the UK which is within one biogeographic region, but some Member States are in several. Differences of interpretation between Member States, together with the challenge of reporting for several biogeographic regions would have implications for the ability to provide compensation for habitats and species by seeking to maintain conservation status at the level of the biogeographical region, one of the options considered in the Phase Two research.

Conclusions and possible framework for Equal Value Compensation

Need To Consider Compensation on a Wider Geographic Scale

24. Ability to compensate for adverse effects on European habitats and species depends on the ecology of those habitats and species (does their survival depend on conservation *in situ* or can they be enhanced or restored in alternative locations?) and on the existence of opportunities to deliver sufficient compensation to offset impacts of the type and magnitude identified (the subject of other studies).

In broad terms, ecological compensation under the Habitats Directive must maintain:

- a. The integrity of the site(s) for which residual adverse impacts have been identified.
- b. The conservation status of the designated interest features of the site(s).
- c. The overall coherence of the Natura 2000 network.

In the case of the STP options, compensation opportunities using the current (non statutory) European

Commission Guidance are limited. It may not be possible to maintain the integrity of the site and, further, it may prove impossible to maintain the conservation status of some designated features unless the allowable area for delivery of compensation is widened to the level of the Atlantic Bio-geographic region.

reasonable measures have been taken to avoid and minimise impacts, so that those remaining can be considered 'residual' and 'unavoidable' before options for compensation are explored. The Directives require that Member States take all compensatory measures necessary to secure the overall coherence of the Natura 2000 network. The Phase 2 research suggests that there are three possible options for ensuring that such an approach is taken:

Options for Compensation

25. To comply with the Directives it is necessary to demonstrate that all

Option 1	Compensation using the same features as those affected ("like for like" or "within type") and located within the same functional ecological unit as the affected site.	This is the preferred option because it provides the clearest benefit to overall coherence, acting on the affected features near the original location. For example, provision of compensatory habitat outside the original site boundary might ensure that the same populations of a species can still access suitable habitat despite losing some suitable habitat within the original site boundary.
Option 2	Compensation using the same features as those affected but located within a different functional ecological unit	In this case, contribution of the site to the coherence of Natura 2000 is permanently affected, but coherence of the network as a whole may be maintained if compensation ensures that other sites are brought into the network and perform a similar role. Compensation measures address the same habitats or species, but not the same populations or individuals. This occurs under some examples of current practice, with the intention of ensuring that the Member State retains the same amount of a designated habitat under protection and that species populations are maintained at a similar level. Current guidance does not give clear advice concerning appropriate location of compensation to maintain coherence of the network as a whole or the conservation status of the interest features.
Option 3	Compensation by substituting different features to those affected ("out of type"), whether within the same or a different functional ecological unit.	Compensation may deliver new sites which seek to achieve same conservation objectives. This approach is likely to mark a shift to achievement of Favourable Conservation Status at a wider scale Coherence depends on changing the representation and geographical distribution of habitats and species within the Natura 2000 network as a whole. It allows substitution between habitats and / or species providing certain conditions can be met (reflected in the suggested tests). It does not reflect current practice.

Conditions and Tests for Considering Acceptability of Compensation Options

26. Should loss of the integrity of a European Site be countenanced for reasons of overriding public interest, certain conditions would have to be met for compensation to be considered appropriate, both of which relate to the overall goal of achieving FCS:
- a. Those relating to the acceptability of compensation i.e. application of thresholds. Compensation would not be valid if residual adverse impacts will be such that FCS will no longer be achievable for a site's designated interest features within the geographical frame of reference which has been agreed; or
 - b. Those relating to the optimisation of conservation outcomes and which could potentially be used to justify tradeoffs.

Key Tests

27. Based on these considerations, the proposed approach addresses the validity of compensation using options 2 and 3 by suggesting that two key tests would always have to be met:

Test 1 – The impacted feature will not be pushed below a critical recovery threshold.

Test 2 – The conservation status of the impacted feature is maintained, or that of an allowable substitute is enhanced, in the bio-geographic region.

28. The first test is required to ensure that the overall impact of a project and compensatory measures will not leave the species or habitat in a position from which it cannot regain its former status, and ultimately Favourable Conservation Status, in the biogeographic region. The second test sets the framework for calculation of equal value measurement.

Compensation measures that meet the tests for all affected features would be necessary to ensure compliance. Note that further work would be required to establish the extent of enhancement required to justify a substitution.

Use of Multipliers for Determining Scale of Compensation

29. A multiplier is commonly used to adjust compensation ratios above 1:1 to compensate for different aspects of uncertainty or risk in re-establishing ecological value. Under a 'no net loss' compensation strategy the quantity of compensation applied should be increased by a ratio reflecting the lost interim value. Research in this area indicates a difficulty in establishing a clear rationale for the selection of suitable multipliers and the 2:1 multiplier applied in other elements of the STP Feasibility Study is not based on sound evidence. In the context of the Directives a guaranteed outcome is required and it is necessary to reduce risk of net loss to acceptable levels. There is no single multiplier that will apply in every situation but the multiplier required for a measure with a failure risk of 50% is 5:1 rather than the intuitive 2:1. The application of such a multiplier would therefore have a significant impact on the scale and cost of any compensatory measures.

External Stakeholder Engagement

30. The requirements to keep the STP Feasibility Study within a restricted circle of engagement were acknowledged by the SDC and, whilst we felt it deviated from good practice, we accepted this condition in this commission due to the sensitive nature of the work. However, various external stakeholders were aware of the Equal Value Investigation and requested informal engagement with us

on the process which we managed within the requirements for confidentiality on emerging findings.

31. Concerns were expressed on a range of issues, from fundamental objections to Equal Value as a concept in itself to criticisms of methodology and legality. Some of these concerns are outside the scope of this Investigation but they are legitimate issues that will need to be addressed through further dialogue. Those relating to a lack of engagement are highlighted as a particular risk to the future success of any proposals due to possible non-compliance with the Aarhus Convention.

Sustainable Development

32. During Phase One there was an acknowledgement of the need to consider the role of societal decision making within this process, to reflect administrative and governance mechanisms. Recommendations for equal value compensation will need to be assessed against what is socially acceptable and / or appropriate if there is to be wider community engagement and support for delivery.
33. In addition, whilst this investigation focused on Equal Value compensation it raised wider issues, in particular around land use and energy generation, that need to be considered by various UK and Welsh Assembly Government departments. Climate change and renewable energy policies could undermine the existing coherence of the Natura 2000 network due to potential impacts arising from their spatial expression, and thereby present considerable challenges to the Directives.
 - c. That the effect on Favourable Conservation Status may be used as a value system for substitutes, including options for trading up.

However this could also provide an opportunity to strategically rethink our approach to managing our coastline, wetlands and floodplains and build ecosystem restoration thinking into all infrastructure / energy projects.

34. This research does not indicate a requirement to amend the Directives. It does suggest an opportunity to improve the definition of, and the approach to delivering on, coherence through an updated interpretation of the guidance.

Recommendations

35. Due to the constraints of the research itself, the inherent uncertainties that emerged from Phase One and discussions with wider stakeholders, the set of proposed principles outlined below are exploratory rather than definitive and it is recommended that they, together with all the findings of this investigation, undergo further testing and comprehensive dialogue with stakeholders within the context of the overall STP Feasibility Study outputs.

Principles for Equal Value Compensation

36. The proposition that substitution might be allowable is based on the following principles:
 - a. That the measure improves the overall coherence of the Natura 2000 network so that the benefit to the network from a substitute is greater than the disbenefit incurred from the loss of the feature substituted for
 - b. That the coherent network contributes to Favourable Conservation Status
 - d. Approaches should, where possible, be ecosystem based / large scale and should also help adaptation to climate change.

37. The Phase 2 study suggests it may be possible to identify compensation which would have an acceptable outcome in ecological terms if equal value is defined in terms of conservation status. Widening the area within which compensation can be provided (e.g. beyond the Member State to the bio-geographic area level) increases the options for compensation, but may not be acceptable in legal or political terms.
38. The set of principles themselves should be applied in accordance with the principles of sustainable development to allow Equal Value measures to deliver economic and social benefits. Decisions on compensation should be made after thorough public engagement, reflect public values and sound science, taking into account the limitations of scientific knowledge and incorporating the precautionary principle.
39. Regardless of the viability of Equal Value compensation itself, all opportunities must be taken to ensure that recommended compensation integrates and enhances existing and emerging strategies that spatially impact on the Natura 2000 network. This must include resilience to climate change impacts, with the possibility of taking an adaptive management approach that explicitly monitors incremental impacts on habitats and species and adjusts management practices in response.
41. For Equal Value to become a legitimate form of compensation it will be important that clear units of equivalence, in terms of contribution to coherence of Natura 2000, are set. It will be difficult to do this without first defining, in practical terms, what is meant by coherence in its role of contributing to FCS. Whilst the SDC acknowledges the difficulty of achieving consensus on so broad and complex an issue, especially considering the complications of agreeing semantically-precise definitions across languages, there is an opportunity for the UK to take a lead by producing a working interpretation of what coherence means. Any such definitions would be for domestic use and extensive engagement at a European-level would be required to ensure the UK's definition is appropriately valid and robust. Without the development of a commonly agreed language it will prove difficult to gain support for major critical infrastructure such as that proposed under STP.
42. Due to the sensitive nature of the topic, as already outlined, the required debate on definitions and testing of concepts will have to be carefully managed, ideally via a trusted and independent third party, and involve a wide range of stakeholders. A careful planned process will need to be established to ensure that the complexity of nature conservation, as a devolved issue within the UK, and across the Member States within the biogeographical region, as well as the EU as a whole, is effectively considered.

Equal Value Investigation Conclusion

40. In order to operationalise the concept of Equal Value the SDC has highlighted the need for further investigation; indeed this will be critical if the significant investment in the STP Feasibility Study and momentum in this dialogue is to be realised.
43. The complexity of this area and the strategic requirements to both adapt and mitigate for climate change impacts require new ways of thinking around coherence in order to preserve the integrity of the Natura 2000 network and proactively work towards FCS. The Equal Value Investigation has opened a debate on the parameters for 'good

compensation' and represents an opportunity for a discussion on appropriate and broader thinking around compensation in line with the principles of sustainable development, for the benefit of habitats and species across Europe and beyond.